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is in the hands of Dr. W. Migula, of Karlsruhe, and promises to be of great interest and value. Parts I. and II., which have appeared since the first of the present year, are largely devoted to a discussion of general matters. In part II. we have an outline of Dr. Migula's system of classification as applied to the Characeæ. He insists npon their isolated position in the vegetable kingdom, and proposes the name Charophyta for the group, which contains about one hundred and fifty species (and subspecies) in the whole world. These are distributed among six genera, which in turn fall into two sub-families.

### CHAROPHYTA.

**Family Characeæ.**—1. Sub-Family Nitelleæ.—Gen., *Nitella* and *Tolypella*.

2. Sub-Family Chareæ.—Gen., *Tolypelopsis*, *Lamprothamnus*, *Lychnothamnus* and *Chara*.

The German species of *Nitella* number thirteen, nearly all of which are described by the end of Part III. lately received. Good illustrations accompany the full text, and thus give us a most useful work.

## ZOOLOGY.

**Hoplophoria coralligens.**—Is a new Actinian from the Bahamas, described by Dr. H. V. Wilson.[1] Only a single specimen was found. In general structure it was on the ordinary Hexactinian type. The mesenterial filaments were typical, and there were no acontia. The specimen was a female, with ovaries developed on but four mesenteries belonging to the primary cycle. Just beneath the circle of tentacles are four large organs which are diverticula of the gastrovascular space, and which are stinging weapons. These structures are not modified tentacles, but are homologised with the marginal sacs (randäsckchen) which were formerly regarded as eyes in many Actinians. Hoplophoria is regarded as a member of the Antheadæ, in which, besides the points enumerated above, only the six primary mesenteries reach the œsophagus.

[1] Studies from the Biol. Lab., Johns Hopkins Univ., IV., p. 379, 1890.

**Dinophilus.**—S. F. Harmer describes the anatomy of *D. tæniatus.*[2] The animal has two circles of preoral cilia, while each of the five body segments bears two similar circles, interrupted by the uniform ciliation of the ventral surface. The large brain nearly fills the preoral lobe, while the œsophageal commissures connect it with the widely separated ventral cords. These latter lie just outside the basement membrane of the skin, and are provided with five ganglionic swellings. The paired eyes are on the top of the brain ; each consists of a pigmented sac filled with a clear substance. Below them is a pair of small sacs opening to the mouth, and innervated from the œsophageal cords. The mouth is ventral ; the oblique œsophagus receives the ducts of the salivary glands and terminates in the large stomach. This latter is prolong behind into a dorsal cæcum, while below it communicates with the intestine. The anus is just above the tail. The body cavity is but slightly developed. Five pairs of nephridia are present, the hinder pair being converted in the male into vesiculæ seminales. In the young the testes consist of a couple of ventral bands, but in the adult these are enlarged and united both anteriorly and posteriorly. The ovaries are four-lobed. A penis is present, and Harmer has witnessed copulation. Harmer agrees with most observers in regarding Dinophilus as one of the Archianellida. This species is about 2 mm. long, orange in color, and occurred in tide pools at Plymouth, England. Specimens were abundant April 18th. None could be found June 26th.

**Note on an American Species of Phreoryctus.**—The family Phreoryctidæ is composed, as heretofore known, of one genus, containing three species of long and slender oligochæte worms, two of which have been reported from the continent of Europe[3] and one from New Zealand.[4] In Germany, one of the species, *P. menkeanus*, has occurred quite frequently in the water of deep wells. In America this family seems to have escaped observation, as has been already remarked, in fact, by Dr. Minot, in his article on Vermes in the *Standard Natural History*. Recent observations here show, however, that the species is an inhabitant of the subterranean waters of this region ; and I have been fortunate enough to obtain three examples from a farm drain, where the tile was stopped by an ingrowth of the roots of trees.

[2] Jour. Marine Biol. Assn., United Kingdom, No. 2., p. 119. 1889.

[3] See Vejdovsky, " System und Morphologie der Oligochaeten," pp. 48-50.

[4] " On the Reproductive Organs of Phreoryctus." By Frank E. Beddard, M.A., *Ann. Mag. Nat. Hist.*, Ser. 6, Vol. I., No. 6 (June, 1888), p. 389.

This new form is clearly a species undescribed, distinguishable at once from the others by the lack of dorsal setæ on all but the anterior segments of the body. The ventral setæ, on the other hand, are very large and stout, with strongly hooked tips,—diminishing in size near the two ends of the body.

The following description will serve to identify the species.

*Phreoryctus emissarius*, n. s.

A very long and slender worm, six to eight inches, or more, in length (in alcohol), by .6 to .7 mm. in diameter,—the segmentation very distinct, the color pale red, the cuticle highly iridescent. The cephalic lobe is separated from the first segment by a rather deep lateral constriction. It is broadly rounded in front, and about two-thirds as wide as long. I do not see the transverse division of this lobe remarked by Vejdovsky and Beddard in the other species. Segments nearly quadrate, four hundred or more in number. (An imperfect specimen contained three hundred and seventy-five.) Setæ single, acute, the first segment with two very small ventral and no dorsal ones. Four rows on the following segments to the eightieth or ninetieth; on the remainder of the body only two rows, the dorsal setæ disappearing. The last of this series become very minute and variable, and are frequently wanting on here and there a segment preceding the last that bears them. The ventral setæ are very large and long, and strongly hooked, but diminish in size at the two ends of the body. They project into the cœlom, when retracted, a distance equal to two-thirds the whole diameter of the worm.

Two longitudinal blood vessels, both closely applied to the alimentary canal, one dorsal and one ventral, the dorsal one contractile. A pair of long contorted vascular arches in each segment, extending loop-like into the ventral cœlom, below the sub-intestinal vessel. Nephridia, a pair to each segment, opening upon the surface a short distance *in front* of the ventral setæ.

*Champaign, Ill., April 14, 1890.* S. A. FORBES.

**Sea-Urchin Excavations at Guaymas, Mexico.**—Since the publication of my paper [NATURALIST, Jan., 1890] on sea-urchin excavations, I have received a letter from Prof. F. W. Cragin, of Washburn College, Topeka, Kansas, from which I make the following quotations :

" During a short stay at Guaymas, Mexico, in the winter of 1882–'3, I collected for Washburn College a considerable number of sea-urchins of two species, of which you afterwards sent me the names [based on examination of examples of each which I submitted to you] which are *Echinometra vanbrunti* A. Ag., and *Cidaris thouarsii* Val. These were all collected on the sides of a great open sea-cave in the face of a beetling cliff in the outer portion of Guaymas Harbor, and were taken without exception, so far as I now remember, from holes in the solid rock. This was my first knowledge of the rock-boring habit of sea-urchins; but as I supposed the habit to be general with these species, and the matters of my observation to be well-known to all other naturalists, I did not venture to publish it. One fact which I observed, however, seems to me to be at variance with one of your conclusions. In collecting the urchins, I soon learned that if I wished to extract the specimens without injury to themselves, or, in case of the Echinometra, to avoid total failure, made more pointed by pricking my fingers, I must make up my mind in advance just how to seize them to best advantage and then to withdraw them quickly. If I was awkward or slow in any case, or hesitated and took a fresh hold from pricking my fingers, the Echinoderms took occasion to "set" a multitude of spines against the walls of their "geode," and, thus braced, could usually defy further efforts to remove them, save by such harsh means as fractured the bodies of the animals. I am therefore constrained to believe that on being disturbed by the violence of tide and storm-waves, to which they are here greatly exposed, they would set the spines, as they do in a case of human interference. It would certainly then be a rare thing that the action of the water should move them, though it is obvious that if it did succeed in moving one or more of its spines a little, the mutual erosion of spine and rock would be greater than if the spines were not braced. It seems to me, therefore, that very little erosion, so far as the action of the spines is concerned, would be caused by the sea-urchin washing about in the geode, but that the wear produced by the spines, and on the spines themselves, would be due to what might be called the *walking* of the spines; that is, the removing of a spine here and there from its position to such new positions as circumstances demanded. That certain of the spines are so used and become somewhat worn in the case of the two species above mentioned, is possibly indicated by the fact that some of them are obliquely truncated; yet the truncated end seems to be hardly smooth enough for a worn surface, and is perhaps a surface of fracture. Many of the spines have the tip perfect, but it is noticeable that in the Cidaris, whose spines are usually incrusted with species of Serpula and Spirorbis, the tip of the spine is bare or nearly so, and in some instances appears to have been worn bare. The rock in which the excavations were made was very hard, igneous or metamorphic, I think, though I took no note of its lithologic character."

The above quotation is interesting as giving a new location for sea-urchin excavations, although A. Agassiz has already mentioned the rock excavations made by the same species at Panama.

Sea-urchin excavations near San Diego, California, have also been called to my attention by Dr. Cleveland and Mrs. R. S. Eigenmann, and an account of the same from near the Santa Barbara Islands was given me by a fisherman.

A. Agassiz says: "On the coast of California the common *Strongylocentrotus purpuratus* occurs in the same way [as in the Azores,—'in cavities dug out of the solid rock,]; we find long tracts of the shore, where this sea-urchin is common, completely honey-combed and pitted by cavities and depressions, in which they seek shelter against the powerful surf continually beating against the rocks. The same species does not excavate in sheltered places, where sea-urchins can find protection between the interstices of large fragments of rocks, or ledges more or less sheltered from the direct action of the open sea." [Revision of the Echini, p. 706.] It would seem that these excavations are not uncommon to the west coast of North America, although very few definite localities where they occur have up to the present time been recorded.

As the author desires to gather information in regard to the distribution of sea-urchin excavations, and the extension or limitation of the habit among genera and species of the Echinoidea, he desires to correspond with any who may have observed this phenomenon on any coast. He wishes especially information as to the names of the species of sea-urchins which make the excavation, the kind of rock excavated, and peculiar circumstance connected with the species.

*Boston, Mass., April 9th, 1890.* J. WALTER FEWKES.

**The Ribs of Vertebrates.**—At the last meeting of the Anatomical Society, at Berlin, Professor Hatschek presented some new evidence as to the homologies of the ribs within the vertebrate phylum. In Polypterus there are certain peculiarities which have been given different interpretations by different observers. In the body region each vertebra bears a pair of processes which extend from the centrum in a transverse direction, and are continued by a rodlike bone of considerable size. Just below this is a second delicate bony thread. In the caudal region the processes and their continuation diminish, while the ventral thread becomes larger and forms the hæmal arch.

According to some the ventral bones are homologous with the ribs of other fishes, while the dorsal rods are "flesh bones." According to others exactly the reverse is true. As tests, Hatschek calls attention to the fact that the muscles in the body of a vertebrate are divided into dorsal (epiaxial) and ventral (hypaxial) portions. In the fishes the ribs occur between the hypaxial portions and the somatopleur, while the ribs of Batrachia and Amniotes are new structures lying between the epi- and hypaxial portions. In the body regions of these forms the old fish ribs have disappeared, although they occasionally reappear in the caudal portion, old and new ribs coexisting together. Applying this test of position to the structures seen in Polypterus it is seen that the first view is the correct one, the dorsal half being the new or Batrachian rib. In Batrachia and Amniotes the rib articulates with the vertebral centrum by two articular processes which primitively represent a forked proximal extremity. Götte found that the rib in its development consisted of dorsal and ventral portions, which distally grow together while proximally they remain forked. Wiedersheim compared only the lower portion with the ganoid rib, and regarded the dorsal portion as a new structure. This seems to be negatived by the conditions found in the Batrachian tail. Hatschek farther concludes that the vertebrate skeleton should be divided into somatic and visceral portions, and that the former should be further subdivided into axial, dermal, and septal portions, the latter embracing the portions arising in the myosepta.

**The Families of Ribbon-fishes.**—In the AMERICAN NATURALIST for January, 1887 (Vol. XXI., p. 86), I have given a diagnosis of the Tæniosomi. We have now the data for determining the common and comparative characters of the best known and only certain representatives of the suborder. For the Regalecidæ Prof. Parker's valuable Memoir (T. Z. S., Vol. XII., pt. 1), and for the Trachypteridæ, a lately published monograph by Alexander Week (Studies Mus. Zool., Univ. Dundee, Vol. I., pt. 6), furnish the requisite information. The differences between the two families are greater than would have been anticipated, and necessitate a revision of the diagnosis of the suborder. The characteristics may now be expressed in the following terms:

### TÆNIOSOMI.

Teleocephals with the scapular arch subnormal, posttemporal undivided and closely applied to the back of the cranium, between the epiotic and pterotic, or upon the parietal; hypercoracoid perforate at or near the margin; cranium with the epiotics enlarged, encroaching backward and juxtaposed behind, intervening between the exoccipitals and supraoccipatal; prootic and opisthotic represented chiefly by the enlarged prootic; the suborbital chain imperfect; the copular bones separated by intervening cartilaginous elements; the hypopharyngeals styliform and parallel with the branchial arches, epipharyngeals in full number (4 pairs), and mostly compressed; the dorsal fin composed of inarticulate rays or spines, separable into lateral halves, and the ventrals (when present) sub-brachial.

A myodome may be present or absent, none being developed in the Regalecidæ, but one being distinct and supplemented by a dichost in the Trachypteridæ. The families may be briefly differentiated as follows:

### TRACHYPTERIDÆ.

Tæniosomes with the body moderately elongated and very compressed, the head short, the opercular apparatus abbreviated (the operculum extended downwards, the suboperculum below it, and the interoperculum contracted backwards and bounded behind by the operculum and suboperculum), ventrals pauciradiate in young, atrophied or lost in adult, the cranium with a myodome and dichost, the supraoccipital continued behind into a prominence, the epiotics confined to the sides and back of the cranium, and without ribs.

### REGALECIDÆ.

Tæniosomes with the body very elongated and compressed, the head oblong, the opercular apparatus well developed (the operculum extended backwards, the suboperculum obliquely behind it, and the interoperculum extended upwards below the two), the preorbital chain oblique and widest at the second bones, ventrals represented by single elongate rays, the cranium with the myodome atrophied, and the dichost suppressed, the supraoccipital pushed forward by the extensive development of the epiotics which encroach forwards on the roof as well as back and sides of the cranium, and with short ribs.—THEO. N. GILL.

**The Genera of the Podocnemididæ.**—Through the kindness of Prof. R. Hertwig, of Munich, I have received the skull and cervicals of two specimens of the type of *Emys tracaxa* Spix. for examination. I am now able to give the characters of the known genera of the Podocnemididæ. Boulenger considers *Emys tracaxa* Spix. the type of *Peltocephalus* Dum. & Bibr., and *Dumerilia madagascar-*

*iensis* Grandid., the type of my Erymnochelys, generically the same as Podocnemis.

The genus Dumerilia was established by Grandidier, but since this name had been used different times before, I introduced the name Erymnochelys (*Zool. Anz.*, No. 285, 1888.) After this, Boulenger claimed that Erymnochelys mihi (Dumerilia, Grandid.) was a synonym of Podocnemis. In No. 296 of the *Zool. Anz.*, 1888, I gave the generic characters which distinguish Erymnochelys from Podocnemis. I said in Erymnochelys the jugal is in extensive connection with the quadrate; this connection is absent in Podocnemis; in Erymnochelys the prefrontals are produced in front and without median groove; the cervical vertebræ form single condyles. In Podocnemis saddle-shaped vertebræ, as in birds, are present.

In the general shape of the skull Peltocephalus resembles Macrochelys; Peltocephalus is in the same relation to Erymnochelys, as Macrochelys to Chelydra. Morphologically the skulls of Erymnochelys and Peltocephalus are very much alike; but Peltocephalus has the saddle-shaped cervicals of Podocnemis.

The atlas of Podocnemis is entirely different from that of Peltocephalus and Erymnochelys. In Podocnemis the first intercentrum is small and free. In Erymnochelys and Peltocephalus it is large and internally united with the neuroids and the centrum of the atlas.

I give now a table of the characters of the three genera:

*Podocnemis*, Wagler.

Jugal and quadrate bones separated; articular faces of anterior cervicals saddle-shaped; first intercentrum small and free. Type: *P. expansa*, Schweigg.

*Peltocephalus*, Dum. and Bib.

Jugal and quadrate in contact; articular faces of anterior cervical saddle-shaped; first intercentrum large and suturally united with neuroids and centrum of atlas. Interparietal shield triangular with base behind. Type: *P. tracaxa*, Spix.

*Erymnochelys*, Baur.

Jugal and quadrate in contact; articular faces of cervicals not saddle-shaped; first intercentrum large and suturally united with neuroids and centrum of atlas. Interparietal shield triangular with base in front. Tpye: *E. madagascariensis*, Grand.

Note.—The condition of the atlas in Peltocephalus and Erymnochelys, must be considered as one from which the condition seen in the

Pelomedusidæ has been derived. In the Sternothæridæ (Pelomedusa, Sternothærus) there is no trace of a suture between intercentrum and the centrum of the atlas. If the sutures of the atlas in Peltocephalus or Erymnochelys would disappear, we would have the conditions of the Sternothæridæ. Erymnochelys and Peltocephalus agree with all known Pleurodira in the fact that the centrum of the atlas supports the neuroids; a condition never seen in the Cryptodira or Chilotæ (Tronychia). (Baur, *Ann. and Mag. Nat. Hist.*, July, 1889).—G. BAUR, PH.D.

**Note on the Genera Hydraspis and Rhinemys.**—Boulenger accepts in his catalogue of Tortoises the genera Hydraspis and Rhinemys. His genus Hydraspis contains seven species, *H. hilarii*, *H. tuberosa*, *H. geoffroyana*, *H. gibba*, *H. radiolata*, *H. rufipes*, *H. wagleri.*

His genus Rhinemys contains one species, *Rh. nasuta.*

Rhinemys is characterized: Neural plates present; parietal bones not expanded superiorly; parieto-squamosal arch very slender.

Hydraspis: Neural plates present; parietal bones expanded superiorly; parieto-squamosal arch strong.

The question is; first, can the name Hydraspis be adopted; aud second, is Hydraspis generically different from Rhinemys, Boulenger, non Wagl.

1. *Can the name Hydraspis be adopted?*

In 1811 Oppel[1] separated *Emys longicollis* from Emys as a "subgenus," for which he gave the following diagnosis; Collo longissimo, subtestam arcuate reflexo, non retractili; *e.g.*, *E longicollis*, without creating a new name.

In 1828 Fitzinger[2] established Chelodina for "Emys longicollis und consorten." The type of Chelodina is therefore *Emys longicollis* Shaw.

Two years latter Bell[3] established the genus Hydraspis, with nine species (p. 512), *Testudo longicollis*, which I consider the type; *T galeata* of Schoepff, *T. planiceps* Schoepff, *Emys amazonica*, *E. viridis*, *E. depressa*, *E. macrocephala*, *E. tracaxa*, *E. rufipes* Spix.

Later on (p. 515) we find Hydraspis: sp. typ. *H. galeata* (*Testudo galeata* Auct.) It is quite evident that Bell's Hydraspis is simply a synonym of Fitzinger's Chelodina, and has no right to existence.

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[1] Oppel, Michael, Die Ordnungen, Familien und Gattungen der Reptilien. München, 1811, p. 12.

[2] Fitzinger, L. J. Neue Klassification der Reptilien, Wien, 1826.

[3] *Zool. Journ.*, III., 1828.

In 1830 Wagler establishes the genera: Rhinemys, Hydromedusa, Podocnemis, Platemys, Phrynops, Pelomedusa.

Rhinemys contains the species: *Emys rufipes*, Spix., *Emys nasuta*, Schweigg, *Emys radiolata*, Spix., *Emys gibba*, Schweigg. The type of Rhinemys is *Emys geoffroyana* Schweigg. It is now proper to examine whether *Emys rufipes* Spix., is generically different from *Emys geoffroyana* Schweigg; in other words, whether Phrynops is different from Rhinemys. Through the great kindness of Prof. R. Hertwig, of Munich, I have received the skull of the type of *Emys rufipes* Spix. for examination. The skull is characterized by the very much expanded parietals, which are twice as broad as the interorbital space.

In *Emys geoffroyana* Schweigg, the type of Phrynops, the parietals are not so much expanded, but in all other respects Phrynops agrees with Rhinemys, and there can be no doubt that Phrynops is not different generically from Rhinemys.

The type of Rhinemys Wagler is *Rhinemys rufipes* Spix; the other species of Rhinemys are: *Rh. hilarii*, *Rh. tuberosa*, *Rh. geoffroyana*, *Rh. gibba*, *Rh. radiolata*, *Rh. wagleri*. Boulenger's Hydraspis is therefore synonym of Rhinemys.

2. *Is Boulenger's Rhinemys generically different from his Hydraspis?*

In Rhinemys of Boulenger, with the single species *Rh. nasuta*, the parietals have become very slender; in other words the reduction, which has already begun in some of the species of Rhinemys mihi (Hydraspis, Blgr.) has increased. This, and also the slenderness of the parieto-squamosal arch, is certainly no reason to distinguish this form as generically different from the others. According to Boulenger there are only four neural plates in his Rhinemys, six in his Hydraspis, but the question is, whether the number is constant in Hydraspis; the number in *Rhinemys rufipes* and *Rh. wagleri* is not yet known. Of course there is no doubt that if Boulenger's Rhinemys should even prove to be different generically from his Hydraspis, the name Rhinemys could not be used, and another name must be given. I think it best to consider *Emys nasuta* of Schweigg as a species of the genus Rhinemys Wagler, as adjusted by me.

I give now the following synomy:

CHELODINA Fitz., 1826=Hydraspis Bell, 1828.
Type *Ch. longicollis* Shaw.

RHINEMYS Wagler, 1830=Phrynops Wagler, 1830=Hydraspis (Blgr.)+Rhinemys (Blgr.), 1889.
Type, *Rh. rufipes*, Spix.

—G. BAUR, Ph.D.

**The Genera of the Cheloniidæ.**—Boulenger, in his Catalogue of Tortoises, admits only two genera of Cheloniidæ—Chelone and Thalassochelys. His genus Chelone includes Caretta or Eretmochelys, Euchelys and Onychochelys. His Thalassochelys includes Lepidochelys, Colpochelys, Cephalochelys and Eremonia.

I have examined a great number of skulls and skeletons of Cheloniidæ in different museums, and have reached the following conclusions, which partially at least have been published before:

1. Chelonia Brogn., 1799. *Jour. des Sciences des Lettres et des Arts,* par A. L. Millin. Vol. V., 6, 1799.

Orbit formed by: prefrontal, frontal, postfronto-orbital, jugal, maxillary.

Maxillaries separated by vomer.

Descending processes of prefrontals in connection with palatines.

Number of peripheralia, 11; No. 10 without connection with rib.

Type: *Chelonia mydas* L.

2. Caretta Ritgen, 1828. Eretmochelys, Fitz.

Orbit formed by: prefrontal, frontal, postfronto-orbital, jugal, maxillary.

Maxillaries separated by vomer.

Descending processes of prefrontals without connection with palatines.

Number of peripheralia, 11; peripherale 9 without connection with rib.

Type: *Caretta imbricata* L.

3. Thalassochelys, Fitzinger, 1835.

Orbit formed by: prefrontal, postfronto-orbital, jugal, maxillary.

Maxillaries in contact, not separated by vomer.

Descending processes of prefrontals in connection with palatines.

Number of peripheralia, 11; peripherale 9 without connection with rib.

Type: *Th. caretta* L.

4. Lepidochelys (Fitzinger) Gray, Colpochelys Garman.

Orbit formed by: prefrontal, postfronto-orbital, jugal, maxillary.

Maxillaries separated by vomer.

Descending processes of prefrontals without connection with palatines.

Number of peripherlia, 11 or more; connection with ribs as in Thalassochelys.

Type: *L. olivacea* Eschsch.

Through the kindness of Dr. O. Boettger I have received a skull of *Lepidochelys olivacea*, from West Africa, for examination. Later I found in the collection of the Smithsonian Institution a skull of a sea-tortoise from Ventosa Bay, Mex., collected by Prof. Sumichrast, of the same genus.

*Lepidochelys olivacea* Eschsch. is distinguished from *Lepidochelys* (Colpochelys) *kempii* Garman, by the very much more expanded pterygoids, and the large ectopterygoid processes. There are no ridges on the alveolar surfaces of the upper jaw, and there is an indication of a median keel at the symphysis of the lower jaw.

The specimens on which the genera Euchelys, Girard, and Onychochelys, Gray, have been established I do not know, neither do I know Gray's genera, Cephalochelys and Eremonia. *Chelonia depressa* Garman, which is considered by Boulenger as a synonym of *Chelonia mydas*, without indication of any reason whatever, a thing very often repeated by Mr. Boulenger, does not belong to the genus Chelonia at all. Through the kindness of Mr. Garman, I have examined the type, which is represented by a stuffed specimen. The lower jaw has a greatly developed hook very much like *Lepidochelys kempii* Garman, but there is a median ridge on the symphysis, something like *Lepidochelys olivacea* Eschsch. Until the skull of this species is known, it is impossible to decide whether it belongs to Thalassochelys, Lepidochelys, or, what I think probable, to a new genus.

*Chelonia multiscutata* Kuhl is possibly an abnormal specimen of *Lepidochelys olivacea* Eschsch. Kuhl described this species after a specimen in Groningen. According to a letter kindly received from Prof. Van Anhum (dated Nov. 21, 1887), none of the collections at Groningen contain the original.

There is a great number of species of Cheloniidæ, which have been described by different authors; future examinations will show whether these species are in existence or not. There is no doubt whatever that the Chelonia from the Pacific is a different species from the Atlantic; the skulls are the same, but there are great differences in the form of the carapace. I have seen a great number of young specimens of Chelonia collected by the Albatross on the Galapagos Islands. These have 1–6 peculiar dermal plates between the marginalia and the infra-marginalia. I propose to call these plates *submarginals*. It remains to be decided whether this species is the same as *Chelonia agassizii* Boc., or not.—G. BAUR, Ph.D.

**Zoological News.—Molluscs.**—Garstang, in a catalogue of the Nudibranchs of Plymouth, England,[1] gives many instances of the protective coloration of these forms. The author catalogues thirty-six species, the whole making with the notes an admirable faunal list.

J. I. Peck describes[2] the anatomy and histology of the Pteropod *Cymbuliopsis calceola.* The muscles, digestive organs, nervous system, reproductive organs, nephridium, and heart were investigated. The nephridium does not communicate with the pericardium. In the individual studied no penis was found, although the gonad was in female cativity, and the receptaculum was full of spermatozoa.

**Arthropods.**—W. F. R. Wheldon thinks[3] that the tendency of zoeæ to develop their protective spines in one straight line, parallel with the long axis of the body, is of no little advantage in aiding the embryo to swim in a straight line, like men sculling in a narrow racing boat.

G. C. Browne catalogues[4] sixteen species of Copepoda, collected at Plymouth in 1888–89. The notes are largely synomymical.

Some interesting notes the on habits of Crustacea[5] are worthy of notice. Shrimps and prawns keep buried by day, and wander about by night; even those with the eyes extirpated show the same features. Crustacea find their food almost exclusively by scent, while it seems probable that they cannot see much, possibly not even each other. To light and shade, however, they are very sensitive. Certain crabs are fond of decorating themselves with seaweed, etc. The crab takes a bit of weed in its chelæ and deliberately tears it across. He then puts one end into his mouth, and after chewing it up, presumably to soften it, takes it out in his chelæ and rubs it firmly on his head or his legs until it is caught by the peculiar curved hairs which cover them. If not caught it is chewed again, and the process repeated. This is done by night as well as by day, and specimens deprived of sight will clothe themselves as do the others. It is noticeable that there is a marked bilaterality in the arrangement of this ornamention. It does not appear that it is for concealment.

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[1] *Jour. Marine Biol. Assn.*, No. 2, p. 173, 1889.

[2] *Studies Biol. Lab.*, Johns Hopkins Univ., IV., p. 335, 1890.

[3] *Jour. Marine Biol. Assn.*, No. 2, p. 169, 1889.

[4] Ibid., p. 144, 1889.

[5] Ibid., p. 211.